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LIQUID FILTRATION APPARATUS AND METHOD EMBODYING SUPER-BUOYANT FILTRATION PARTICLES

ABSTRACT OF THE DISCLOSURE

Presented is a liquid filtering apparatus and method that overcomes the disadvantages encountered with prior bed filtration systems by providing a filtering apparatus that incorporates a super-buoyant filter medium having a specific gravity very substantially lower than that of the process liquid being filtered. This feature enables a majority of the medium to float on top of the process liquid. The use of super-buoyant media that float principally on top of the process liquid is a feature that provides unique capabilities not provided by other known filtration systems. In essence, the super-buoyant media behave much like a cork floating on a liquid surface. To achieve this effect, the super-buoyant media particles must have a nominal specific gravity less than 50% of the specific gravity of the process liquid to be filtered. These super-buoyant media are typically selected from materials such as lightweight plastics or hollow microspheres formed from glass or ceramic. Due to the significant differences in specific gravity between the media and the process liquid, super-buoyant media produce a highly advantageous means of naturally, gravimetrically separating both clean and contaminated filter media and process liquid into separate "phases". Other factors can also influence the effectiveness of the super-buoyant media as a filter for a given process liquid, and therefore must also be considered in selecting the type of filter media. One of the additional factors in super-buoyant media selection is the attraction of the filter media and the process liquid for one another. A second factor in selecting the type of super-

buoyant filter media is the attraction of the filter media particles to one another. A third factor to be considered is the geometric shape of the filter media particles, while a fourth factor to be taken into account in selecting the type of super-buoyant media is the nature of the process liquid and the physical conditions under which the process functions.